This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

PATENT SPECIFICATION

614,133

Application Date: July 9, 1946. No. 20454/46.
" " Sept. 26, 1946.. No. 28779/46.
One Complete Specification left (under Section 16 of the Patents and Designs Acts, 1907 to 1946): July 3, 1947.
Specification Accepted: Dec. 9, 1948.

Index at acceptance:—Classes 52(iv), M1c(3a: x); and 108(iii), H5a.

PROVISIONAL SPECIFICATION
No. 20454 A.D. 1946

Improvements in or relating to Spring Mattresses

I, HAROLD FREDERICK GODFREY, of 21, Seaside Road, Eastbourne, in the County of Sussex, England, of British Nationality, do hereby declare the nature of this invention to be as follows:—

The present invention relates to spring mattresses and is applicable to mattresses which form part of a rigid structure such as of a bedstead or to separate mattresses having spring interiors.

According to the present invention I provide an improved spring mattress formed from resilient sheet material into a slab-like structure presenting a group of substantially co-planar horizontal surfaces, and having a group of resiliently deflectable portions extending in a vertical direction and uniformly spaced apart.

The slab-like structure may be composed of a number of separate and interconnected units similar to one another, or a continuous sheet of material may be bent to and fro according to a predetermined pattern to present in effect a number of integrally interconnected units.

The supporting area of such a mattress may be determined by the number of units employed. The units may be arranged side by side to build up one surface dimension and end to end to build up the other surface dimension.

The depth of the mattress may be the depth of a single unit, or two or more units may be assembled one upon another, their configuration being preferably such as to provide a certain amount of interlock, or interfit, or honeycomb effect.

In order that the invention may be more readily understood reference will be made to the accompanying drawings which illustrate by way of example preferred embodiments thereof. In the drawings Figures 1 and 2 illustrate two forms of unit construction with different configurations of the sheet material from which the units are formed.

Figures 3 and 4 are sectional elevation and plan views respectively, illustrating how each continuous sheet of material may be bent to and fro according to a predetermined pattern.

Figure 5 is a sectional elevation illustrating an alternative configuration to that in Figure 3.

Referring first to Figure 1 the mattress structure shown consists of a group of units of sheet metal bent into triangular form in cross section. Each unit consists of a horizontal side 1a and inclined sides 1b, the group of sides 1a being co-planar and constituting collectively a weight-supporting surface, the apices of the triangular sections resting on a rigid base 2 which may be formed of longitudinally arranged bars.

Adjacent ends of the horizontal portions of adjacent units are interconnected through resilient buffers 3. The top of each unit may be slotted as at 4 to increase the resiliency and decrease the weight.

On a weight being applied to the upper surface of the mattress the inclined sides 1b of each triangular unit in the vicinity of the weight are bowed outwards affording resiliency to the top surface of the unit.

In Figure 2 each unit of the structure is formed into substantially rectangular form in cross section so as to present both top and bottom horizontal surfaces. This form is more suitable for constructions in which the units are built into the interior of a mattress such as can be on any flat surface and does not necessarily form part of a bedstead.

These units of substantially rectangular form are bent with U-shaped folds 1c directed inwardly towards each other at each end of the unit. On weight being applied to the upper surface the

U-shaped folds of the units in the vicinity of the weight are deflected, the open end of the fold being reduced in size to allow the top and bottom surfaces of the unit to be squeezed closer together. The units are joined together end to end through buffer members 3 and a longitudinal slot 4 or slots may be provided in the upper surface of each unit to increase resiliency and decrease weight.

In Figure 3 a length of sheet material is bent to and fro along its length as shown and the portions 1d of the configuration are secured together through buffer members 3. To form a mattress, lengths of sheet material so bent are arranged edge to edge as illustrated in plan in Figure 4 and adjacent lengths, which are disposed with their ends in staggered relationship to each other in a longitudinal direction, are connected together by wire links 5. As in Figures 1 and 2 the upper surface of each coil may be slotted as at 4 and the slab-like structure may be covered with soft, flexible material 6.

Figure 5 illustrates a similar construction to Figure 3 but the sheet material instead of being bent to a curved configuration is bent to one having straight sides. The vertical portions of each configuration are separated slightly and are secured to each other through buffer members 3.

The width of each unit is preferably not less than three inches but may be varied as required: for example narrow units may be used at the centre of the mattress and wide units at the ends of the mattress.

Dated the 9th day of July, 1946.

For: HAROLD FREDERICK GODFREY,
Stevens, Langner, Parry & Rollinson,
Chartered Patent Agents,
5—9, Quality Court, Chancery Lane,
London, W.C.2, and at
120, East 41st Street,
New York, U.S.A.

PROVISIONAL SPECIFICATION
No. 28779 A.D. 1946

Improvements in or relating to Spring Units for Seats and the like

I, HAROLD FREDERICK GODFREY, a British Subject, of 21, Seaside Road, Eastbourne, in the County of Sussex, England, do hereby declare the nature of this invention to be as follows:—

The present invention relates to spring units for seats and the like. Spring filled upholstery after a period of wear is liable to sag or to become uneven in those regions to which the most weight is applied. This is due amongst other causes to the springs in these regions becoming tired and failing to re-exert themselves to the original extent.

It is an object of the present invention to provide a spring unit the shape or set of which can be varied, either during its initial assembly in a seat, seat-back or the like, or during reconditioning after a period of wear.

According to the invention a spring unit for seats and the like comprises a sheet of resilient material arranged to present a flat upper or working surface and having curved end portions terminating on rigid supports; said end portions being deflectable to allow flexing and displacement of the flat surface in accordance with the relative position of the supports.

According to a further feature of the invention the supports are adjustably mounted in the framework of the seat.

According to another feature of the invention the curved end portions are formed each as a coil and an offset portion is formed between the flat surface and the coil to assist in preserving the shape of the flat surface when the same is displaced.

In a modification according to the invention, auxiliary resilient members are disposed between and secured to the curved end portions and are arranged to bear on an intermediate portion of the flat surface to stiffen the said surface when it is deflected under a weight.

In carrying the invention into effect according to a preferred embodiment thereof a sheet of spring steel of about twelve inches in width intended for a horizontal seat is provided intermediate its ends with a straight portion of about eighteen inches in length.

At each end of the straight portion the sheet is bent downwards and fairly sharply back upon itself to form the offset portions referred to. From these bends the sheet is then bent outwards again in opposite directions to the offset portions this time in substantially circular coils of relatively large diameter as compared to the bends of the offset portions.

The ends of the sheet which are now

situated at the inner ends of the coils are secured to bars which are arranged to engage with a fixed framework of the seat and thus act as supports for the spring sheet.

The flexibility and/or shape of the spring unit can be adjusted by moving the bars at the ends thereof either closer together or further or alternatively by rotating the bars about their longitudinal axes. Thus, if a sag forms in the straight portion, this can be corrected by an adjustment of the supporting bars on the framework of the seat.

If desired auxiliary resilient members having the same shape as the end portions of the main spring element may be disposed intermediate the ends thereof on additional supporting bars to bear on the straight portion and thereby stiffen it.

Alternatively an auxiliary resilient member may be secured to the sides of the coiled end portions which face each other, and bowed upwards so that it bears on the straight portion intermediate the ends thereof. A small spring or a cushion of rubber or other readily compressible material may be interposed between the main spring element and the bowed portion of the auxiliary member.

The curved end portions may be stiffened by providing them with a longitudinal corrugation which extends over a part of the curve.

The spring unit according to the invention is particularly suitable for use in the seats of commercial passenger vehicles. In the case of single seats as are sometimes provided in motor buses one spring unit may be arranged to span the entire width of the seat.

Whilst it is possible to make one unit of sufficient width to cover the depth of the seat it is found that wide units have a tendency to sing when depressed and it is preferred to build up the depth of a seat with two or more relatively narrow units arranged side by side. In the case of long seats such as are to be found in trains the spring units are arranged with their length from front to rear, the width of the seat being built up of a number of units arranged side by side.

Whilst as previously described it is convenient to have one entire surface dimension of a seat spanned by one spring unit only, units may, if desired, be arranged end to end as well as side by side and in the latter case it is preferred to stagger the units in adjacent rows.

Where a number of units are used to construct a seat adjacent units may be connected by means of wire links.

Whilst the invention has been described primarily with reference to seats, it is applicable to spring filled upholstery generally, and may be used for seat or settee backs if desired. The usual padding may be associated with the spring units which owing to their width have little tendency to penetrate or cut their covering.

Dated the 26th day of September, 1946.

For: HAROLD FREDERICK GODFREY,
Stevens, Langner, Parry & Rollinson,
Chartered Patent Agents,
5/9, Quality Court, Chancery Lane,
London, W.C.2, and at
120, East 41st Street,
New York, U.S.A.

COMPLETE SPECIFICATION

Improvements in or relating to Spring Fillings for Upholstery

I, HAROLD FREDERICK GODFREY, a British Subject, of 21, Seaside Road, Eastbourne, Sussex, England, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a spring filling for upholstery. Such a spring filling is applicable to upholstery which forms part of a rigid structure as for example a bedstead, seat or seat back or which may take the form of a separate mattress or cushion.

According to the present invention, a spring filling for upholstery comprising lengths of resilient sheet material bent into a number of slab-like deformable elements each presenting one of a number of co-planar horizontal surfaces is characterised in that each element is connected with or so closely spaced in relation to the element adjacent its sides that when the upholstery is loaded, an edge of the horizontal surface of one element is unable to project above the edge of a horizontal surface of an adjacent element.

The spring filling may be composed of a number of rows of separate and interconnected elements similar to one another, or continuous sheets of material may be bent to and fro according to a predetermined pattern to present in effect rows of interconnected elements. Alter-

natively, the spring filling may be composed of a number of independent elements placed side by side.

The spring filling in its most usual form is intended to rest upon a flat rigid base but in a modification according to the invention the elements may be mounted between rigid supports which may if desired be made adjustable to vary the shape or set thereof.

The area of the horizontal surface presented by the slab-like elements is determined by the number of elements employed. The elements may be arranged side by side to build up one surface dimension and end to end to build up the other surface dimension.

The depth of the mattress may be the depth of two or more elements assembled side by side, their configuration being preferably such as to provide a certain amount of interlock, or interfit, or honeycomb effect.

In order that the invention may be more readily understood, reference will now be made to the accompanying drawings and the drawings accompanying the Provisional Specification filed with application No. 20454/46, which illustrate by way of example preferred embodiments thereof.

In the drawing accompanying the Provisional Specification,

Figures 1 and 2 illustrate two forms of construction with different configurations of the sheet material from which the elements are formed.

Figures 3 and 4 are sectional elevation and plan views respectively, illustrating how each continuous sheet of material may be bent to and fro according to a predetermined pattern.

Figure 5 is a sectional elevation illustrating an alternative configuration to that in Figure 3.

In the drawings accompanying the Complete Specification,

Figures 6, 7, 8 and 9 illustrate various arrangements of the modification in which the slab-like element is mounted between rigid supports.

Referring first to Figure 1 the spring filling shown consists of a group of elements of sheet metal bent into triangular form in cross section. Each element consists of a horizontal side 1a and inclined sides 1b, the group of sides 1a being coplanar and constituting collectively a weight-supporting surface, the apices of the triangular sections resting on a rigid base 2 which may be formed of longitudinally arranged bars.

Adjacent ends of the horizontal portions of adjacent elements are interconnected through resilient buffers 3. The top of each element may be slotted as at 4 to increase the resiliency and decrease the weight.

On a weight being applied to the upper surface of the spring filling the inclined sides 1b of each triangular element in the vicinity of the weight are bowed outwards affording resiliency to the top surface of the element.

In Figure 2 each element of the structure is formed into substantially rectangular form in cross section so as to present both top and bottom horizontal surfaces. This form is more suitable for constructions in which the elements are built into the interior of a mattress such as can be used on any flat surface and does not necessarily form part of a bedstead.

These elements of substantially rectangular form are bent with U-shaped folds 1c directed inwardly towards each other at each end of the element. On weight being applied to the upper surface the U-shaped folds of the elements in the vicinity of the weight are deflected, the open end of the fold being reduced in size to allow the top and bottom surfaces of the element to be squeezed closer together. The elements are joined together end to end through buffer members 3 and a longitudinal slot 4 or slots may be provided in the upper surface of each element to increase resiliency and decrease weight.

In Figure 3 a length of sheet material is bent to and fro along its length as shown and the vertical portions 1d of the configuration are secured together through buffer members 3. To form a mattress, lengths of sheet material so bent are arranged edge to edge as illustrated in plan in Figure 4 and adjacent lengths, which are disposed with their ends in staggered relationship to each other in a longitudinal direction, are connected together by wire links 5. As in Figures 1 and 2 the upper surface of each coil may be slotted as at 4 and the spring filling may be covered with soft, flexible material 6.

Figure 5 illustrates a similar construction to Figure 3 but the sheet material instead of being bent to a curved configuration is bent to one having straight sides. The vertical portions of each configuration are separated slightly and are secured to each other through buffer members 3.

The width of each element is preferably not less than three inches but may be varied as required; for example narrow elements may be used at the centre of the mattress and wide elements at the ends of the mattress.

Referring to Figure 6, sheets of spring steel 8 intended for a horizontal seat are provided intermediate their ends with a straight portion of about eighteen inches in length. At each end of the straight portion the sheet is bent downwards and fairly sharply back upon itself to form offset portions 9. From these bends the sheet is then bent outwards again in opposite directions to the offset portions 9 this time in substantially circular coils 10 of relatively large diameter as compared to the bends of the offset portions.

The ends 11 of the sheet which are now situated at the inner ends of the coils 10 are secured to bars 12 which are arranged to engage with a fixed framework of the seat and thus act as supports for the spring sheet.

The flexibility and/or shape of the spring element can be adjusted by moving the bars 12 at the ends 11 thereof either closer together or further apart or alternatively by rotating the bars about their longitudinal axes. Thus, if a sag forms in the straight portion, this can be corrected by an adjustment of the supporting bars 12 on the framework of the seat.

In a modification shown in Figure 7 an auxiliary resilient member 15 is secured to the sides of the coiled end portions 10 which face each other, and is bowed upwards so that it bears on the straight portion intermediate the offset portions 9. Resilient means such as a cushion 16 of rubber or other readily compressible material is interposed between the main spring element 8 and the bowed portion of the auxiliary member 15.

In a modification shown in Figure 8 an auxiliary resilient curved member 17 adapted to bear on the straight portion of the spring element 8 is secured to the inner side of each of the coiled ends 10.

In the modification shown in Figure 9 auxiliary resilient members 13 having the same shape as the end portions of the main spring element 8 are disposed intermediate the ends thereof on additional supporting bars 14 to bear on and stiffen the straight portion which in this case is riveted to the offset portions 9 and 9a and the coiled ends 10 and 10a.

The spring element 8 may have its resilience increased and its weight reduced by being provided with slots 18 and 19 as shown in Figure 6.

The spring elements according to the modifications described with reference to Figures 6 to 9 are particularly suitable for use in the seats of commercial passenger vehicles. In the case of single seats as are sometimes provided in motor buses each spring element may be of sufficient width to span the entire seat.

Whilst it is possible to make one element of sufficient width to cover the depth of the seat it is found that wide elements have a tendency to sing when depressed, accordingly the depth of a seat is built up with two or more relatively narrow elements arranged side by side. In the case of long seats such as are to be found in trains the spring elements are arranged with their length from front to rear, the width of the seat being built up of a number of elements arranged side by side.

Whilst as previously described it is convenient to have one entire surface dimension of a seat spanned by one spring element only, elements may, if desired, be arranged end to end as well as side by side and in the latter case it is preferred to stagger the units in adjacent rows.

Where a number of elements are used to construct a seat adjacent elements may be connected by means of wire links.

The usual padding may be associated with the spring elements which owing to their width have little tendency to penetrate or cut their covering.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A spring filling for upholstery comprising lengths of resilient sheet material bent into a number of slab-like deformable elements each presenting one of a number of co-planar horizontal surfaces wherein each element is connected with or so closely spaced in relation to the elements adjacent its sides that when the upholstery is loaded, an edge of the horizontal surface of one element is unable to project above the edge of a horizontal surface of an adjacent element.

2. A spring filling for upholstery according to claim 1 wherein the elements are arranged in rows and the ends of the elements in each row are connected together.

3. A spring filling for upholstery according to claim 2 wherein the elements in adjacent rows are connected together.

4. A spring filling for upholstery according to any of claims 1, 2 or 3 wherein each element is bent into substantially rectangular form, the shorter sides extending in a vertical direction and having folds directed inwardly towards each other.

5. A spring filling for upholstery according to claims 2 or 3 wherein each row comprises a number of intercon-

nected elements formed by bending a number of lengths of the sheet material to and fro according to a predetermined pattern.

6. A spring filling for upholstery according to any of the preceding claims wherein resilient buffers are disposed between the adjacent ends of the elements.

7. A spring filling for upholstery according to claim 1 wherein each element is provided with resilient deflectable curved end portions terminating on rigid supports.

8. A spring filling for upholstery according to claim 7 wherein each of the curved end portions are formed as a coil, and an offset portion is formed between the horizontal surface and the coil.

9. A spring filling for upholstery according to claims 7 or 8 wherein auxiliary resilient members are secured to the curved end portions and are arranged to bear on an intermediate portion of the horizontal surface.

10. A spring filling for upholstery according to claims 7, 8 or 9 wherein the rigid supports are mounted in the framework of a seat or the like and are adjustable relatively to one another to vary the shape or set of the elements.

11. A spring filling for upholstery according to any of the preceding claims wherein the horizontal surfaces of a numbers of the elements are slotted.

12. A spring filling for upholstery substantially as hereinbefore described with reference to Figures 1 or 2 of the drawings accompanying the Provisional Specification of application No. 20454/46.

13. A spring filling for upholstery substantially as hereinbefore described with reference to Figures 3, 4 and 5 of the drawings accompanying the Provisional Specification of application No. 20454/46.

14. A spring filling for upholstery substantially as hereinbefore described with reference to Figures 6 to 9 of the accompanying drawings.

Dated the 3rd day of July, 1947.

For: HAROLD FREDERICK GODFREY,
Stevens, Langner, Parry & Rollinson,
Chartered Patent Agents,
5—9, Quality Court, Chancery Lane,
London, W.C.2, and at
120, East 41st Street,
New York, 17, N.Y., U.S.A.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1949.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 2s. 0d. each (inland) 2s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1.

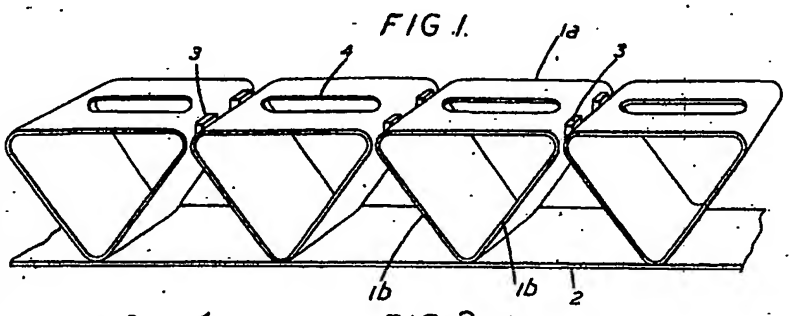


FIG. 2.

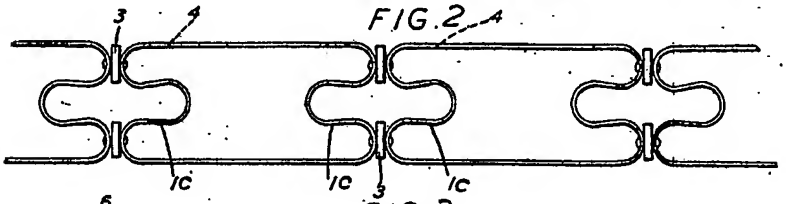


FIG. 3.

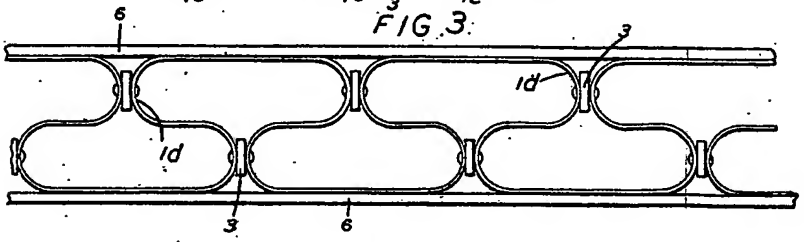


FIG. 4.

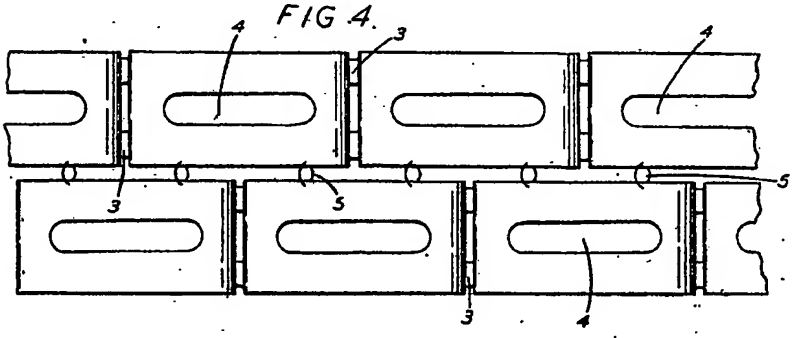
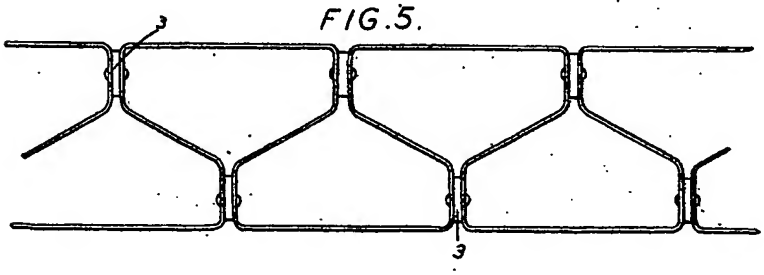


FIG. 5.



H.M.S.O.(Ty. P.)

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG.6.

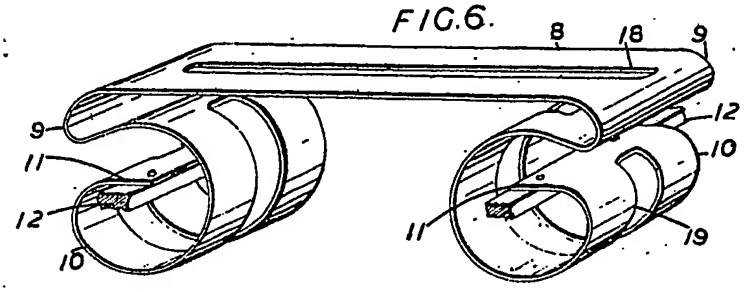


FIG.7.

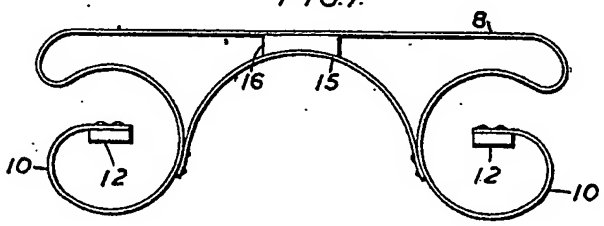


FIG.8.

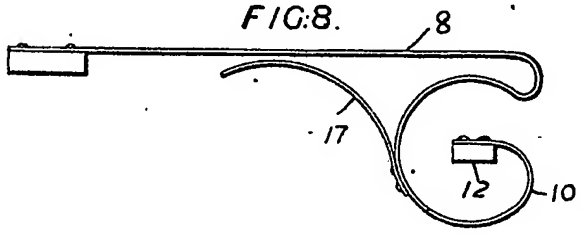


FIG.9.